European Journal of Personality
Eur. J. Pers. **21**: 263–280 (2007)
Published online in Wiley InterScience
(www.interscience.wiley.com) **DOI**: 10.1002/per.630

Comparing IAT and TAT Measures of Power Versus Intimacy Motivation

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Abstract

We assessed implicit orientations towards power versus intimacy using the Thematic Apperception Test (TAT) and the Implicit Associations Test (IAT). In addition, we assessed explicit orientations using self-report measures of dominance versus nurturance motives and extrinsic versus intrinsic values. Further, we assessed the rated self-concordance and importance of power versus intimacy idiographic goals. The six measures formed four factors: motives/values, goals, IAT and TAT. We also assessed a variety of outcomes ranging from well-being to choice in a social dilemma. All six predictors correlated with at least some outcomes, with the values measure being strongest predictor of the predominantly self-report outcomes. We suggest that there is value in simultaneously considering old school and new school approaches to assessing implicit motives. Copyright © 2007 John Wiley & Sons, Ltd.

Key words: IAT; TAT; power; intimacy; motives; attitudes

INTRODUCTION

This special issue of EJP is devoted to the implicit assessment of personality and automaticity. During the last 10 years such assessment has become a burgeoning topic in social/personality psychology, abetted by new developments in computer stimulus presentation and response-timing software. Most prominent among the new techniques is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), which asks participants to quickly place targets into categories, when the categories are associated with either ‘pleasant’ or ‘unpleasant’ words; two concepts are assigned to the same key (i.e. black vs. white and pleasant vs. unpleasant), and the IAT score is represented by the difference in the speed of categorisation when exemplars of a category (i.e. black faces) are paired with pleasant versus unpleasant words, compared to the speed of such categorisation when the exemplars are of an opposing category (i.e. white faces). Via this method,

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Received 9 October 2006
Revised 21 January 2007
Accepted 21 January 2007

participants' implicit positive versus negative attitudes have been assessed regarding a host of bipolar attitude dimensions, including mathematics versus the arts (Blanton, Jaccard, Gonzales, & Christie, 2006), self versus others (Greenwald & Farnham, 2000), men versus women (Haines & Kray, 2005) and East versus West Germans (Bluemke & Friese, 2006).

Implicit attitude assessments have the advantage of bypassing participant self-report, tapping more automatic responses which perhaps predict different outcomes than do self-report responses. And indeed, emerging research is suggesting that implicit attitudes provide unique information for predicting behaviour, information that is not provided by self-report surveys and questionnaires (McConnell & Leibold, 2001; Rudman & Glick, 2001). Notably, there are significant and ongoing debates in the literature concerning the psychometrics, validity and scaling of the IAT (Blanton & Jaccard, 2006; Blanton et al., 2006), and there are also ongoing debates concerning the meaning of the term 'implicit' in the context of the IAT or other indirect measures (de Houwer, 2006). Still, the popularity of the IAT technique continues to increase over time.

IAT researchers, however, appear to suffer from a certain myopia, or at least inattention, with respect to relevant past work (but see Brunstein & Schmitt, 2004). After all, the assessment of implicit attitudes and orientations is not a new phenomenon—it goes back to the 1930s, with the development of projective tests based on psychodynamic approaches to personality (McClelland, 1987; Murray, 1938). Indeed, the distinction between 'implicit' and 'explicit' was first introduced and discussed in the context of projective testing; specifically, McClelland, Koestner, and Weinberger (1989) focused on the Thematic Apperception Test (TAT) in their seminal comparison of self-report ('self-attributed') motive measures and projective (i.e. 'implicit') motive measures. In contrast to the reaction time methodology of the IAT, the TAT asks participants to write stories concerning ambiguous pictures and scenes, which are later coded in terms of motives such as achievement, intimacy, power and affiliation.

McClelland et al. (1989) reviewed evidence that implicit motives (as measured by the TAT) emerge from early reinforcements and learning history, predating the development of the self-concept. Such motives tend to interact with situational incentives to influence individuals' spontaneous or operant behaviour over time. In contrast, explicit or self-report motives reflect peoples' conscious beliefs and preferences, which emerge later in development. Explicit motives are derived from cognitively elaborated self-theories and influence peoples' responses to social and self-presentational forces within the immediate environment.

Interestingly, the new generation of implicit attitude measures are said to have similar properties as the older generation of implicit motive measures, despite some differences (discussed below). Again, implicit attitude measures have been shown to predict spontaneous behaviour and behavioural choices in ways that self-report measures do not, just as do implicit motives (McConnell & Leibold, 2001; Rudman & Glick, 2001). Also, implicit attitudes are said to operate largely automatically (Greenwald et al., 1998), just as do implicit motives. Furthermore, implicit attitudes are thought to be much harder to disguise and less susceptible to impression-management attempts by the participant, similar to implicit motives (Egloff & Schmukle, 2002; Schnabel, Banse, & Asendorpf, 2006; Steffens, 2004). Finally, both types of measure are thought to represent dispositional constructs that are at least somewhat stable over the lifespan (Egloff, Schwerdtfeger, & Schmukle, 2005; McAdams, 2001)

Of course, there are differences between the TAT and the IAT. One difference concerns the focal construct; the IAT is typically used to assess ingrained evaluative attitudes towards stimulus objects, attitudes which bias peoples' responses to those objects. More

DOI: 10.1002/per

generally, the IAT may assess automatic associations between stimulus objects and other concepts, although it has been employed primarily to examine associations of objects with evaluative terms (as in the present research). In contrast, the TAT is presumed to assess foundational motives embedded within personality, motives that orient the perceptual system and seek expression within the world. The degree of convergence between implicit attitudes and implicit motives is still not well understood, and has as yet received little empirical attention (although see Sinclair et al., 2005, for evidence that peoples' affiliative motives influence the degree they tune their own implicit attitudes to the attitudes of another person, and Hausmann & Ryan, 2004, for evidence that motives to control prejudice can influence implicit prejudicial attitudes). Another difference, of course, concerns the methodologies of the two methods. Presumably, the story-based approach of the TAT taps fundamental meaning-making systems within the person, whereas the IAT's response-time approach merely taps subtle and automatic inhibitions that occur when certain concepts are associated (i.e. 'good' with 'black'). It is as yet unknown how closely linked these two processes are—for example is the disposition to tell certain types of stories correlated with quicker categorisation of type-relevant attitude objects when those objects are associated with 'good' words? Because of these differences, the IAT and the TAT may not necessarily be highly correlated. However, presumably they will correlate at least modestly, given their common focus upon automatic feelings and responses.

The current research

TAT, IAT, intimacy and power

In the current research we examined the TAT and IAT in conjunction with each other, both to bring the TAT back into the debate over the meaning of 'implicit' and 'explicit', and to shed new light upon the meaning of the IAT. To accomplish this we focused on the contrast between intimacy (having close and sharing relationships with others) and power (having influence and impact upon others). We chose this contrast for three reasons. First, intimacy and power are two of the 'big four' social motives traditionally assessed by the TAT (along with achievement and affiliation), allowing us to connect the current research with a wide body of prior TAT research. Second, of the four traditional motives, intimacy and power provide the best thematic contrast with each other (often correlating negatively), a contrast which parallels other distinctions in the literature (i.e. agency vs. communion, egocentric vs. allocentric, separation vs. inclusion). Selection of contrasting motives also seemed warranted because the IAT typically focuses on the contrast between thematically opposite elements (i.e. black vs. white faces, Republican vs. Democratic candidates, male vs. female bodies), suggesting that a similar measurement approach should be taken with the TAT. Third, the distinction between intimacy and power has relevance for psychological well-being. For example Emmons (1991) showed that power-oriented persons are somewhat lower in well-being than intimacy-oriented persons, presumably because of their excessive concern for achieving status and control at the expense of genuine interpersonal relations (Helgeson, 1994). Similarly, Kasser and Ryan (1993, 1996) have shown that those with strong status and influence-seeking (i.e. extrinsic) values tend to be lower in well-being than those with strong relationship and community (i.e. intrinsic) values. In the current study we hoped to compare the TAT and IAT methods of assessing power versus intimacy orientation, to evaluate whether either method predicts well-being. Because well-being is an explicit measure and the TAT and IAT assess implicit constructs, we did not necessarily expect an association.

DOI: 10.1002/per

Notably, contrasting two different stimulus types (as occurs in most IAT assessments) introduces measurement complications (Blanton & Jaccard, 2006; Blanton et al., 2006), complications that arise whenever a difference-based measure is used. For example if intimacy motivation is subtracted from power motivation, a person low on both power and intimacy might receive the same score as a person high on both power and intimacy. One emerging way to deal with this problem in the IAT literature is to employ a 'single-category' approach in which a particular stimulus type and its exact opposite are used (i.e. successful/unsuccessful, as paired with I/other words; Brunstein & Schmitt, 2004). Again, however, in the current research we used the more traditional approach of examining the latency differences between two more divergent stimulus categories, employing a parallel difference score procedure with all of the other assessment approaches. Because this was somewhat unusual treatment for many of the predictor variables, non-findings for a particular assessment type cannot necessarily be interpreted as a failure of that assessment type in general; however, positive findings can be interpreted as consistent with our conceptual and measurement approach.

Four more approaches to power versus intimacy

Explicit motives

In addition to assessing intimacy versus power motivation via both the TAT and the IAT, we also approached the intimacy versus power distinction via several other assessment techniques. First, we administered the dominance and nurturance scales of the Personality Research Form (PRF; Jackson, 1984), which have been used in a wide variety of studies (see Vernon, 2000). The PRF emerged from the same motive disposition tradition as the TAT and thus its dominance scale is closely akin to power motivation and its nurturance scale closely akin to intimacy motivation. The difference is that the PRF is an explicit or self-report measure of these motive constructs, whereas the TAT is an implicit measure. The inclusion of the PRF allows for a contrast between implicit and explicit measures of these important social motives. Because the PRF is an explicit measure, we thought that the dominance/nurturance difference might predict self-reported well-being.

Explicit values

Second, we assessed participants' values. Values represent peoples' conscious (and thus explicit) estimations of what ideals and long-term futures are important in life. Like motives, values are thought to provide foundational guiding principles for behaviour, despite coming from a separate tradition in personality psychology. Because of this overlap, inclusion of an appropriate value measure in the study seemed warranted, so that the intersection of explicit values and motives could be evaluated. Specifically, we administered the Aspiration Index (AI; Kasser & Ryan, 1993, 1996), already discussed above. The AI assesses extrinsic (i.e. money, fame, image) versus intrinsic (i.e. community, intimacy, personal growth) values. Intrinsic values are said to reflect inherently satisfying pursuits of helping, communing and connecting with others, whereas extrinsic values reflect less satisfying and potentially compensatory pursuits of achieving status, wealth and influence (see Kasser, 2002, for a review of this literature). As can be seen in this description, intrinsic and extrinsic values appear to provide reasonably similar thematic constructs to intimacy and power motivation, further warranting their inclusion in this study. Notably, Kasser and Ryan's research has typically focused on the difference between extrinsic and intrinsic values, showing that those with a greater relative preference for

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extrinsic values tend to be lower in adjustment and well-being (see Kasser, 2002, for a review). Thus, we expected that this construct in particular would predict well-being.

Personal goals

Third, we conducted a personal goal assessment, directing participants to list and rate four intimacy and four power goals. Personal goals represent yet another tradition in personality psychology, one that focuses on idiographic behavioural initiatives (i.e. goals; Emmons, 1999). Still, like values and motives, personal goals are thought to serve as primary organisers of behaviour. Thus, their inclusion within our comparative study seemed warranted. In order to assess the strength of intimacy and power motivation via the goal-assessment, we asked participants to rate the simple importance of their eight goals, from which we computed a relative power versus intimacy difference score. We also assessed the self-concordance of the eight goals, that is the extent to which they are pursued for reasons of interest and identification, rather than for reasons of pressure and guilt (Sheldon, 2002, 2004). This measure, based on self-determination theory's *perceived locus of causality* construct (PLOC; Deci & Ryan, 1991, 2000), provides yet another way of assessing the relative centrality of power versus intimacy motivation within conscious experience. Notably, self-concordance has been shown to predict explicit well-being in the past (see Sheldon, 2004, for a review). However, no prior research or theory has addressed the difference in self-concordance for two different types of goals. Thus, although we might expect either the power or intimacy self-concordance measure to predict well-being on its own, we made no predictions concerning the difference between the scores.

An added advantage of a personal goal assessment is that personal goals can be viewed as midway between 'operant' and 'respondent' constructs (Emmons and McAdams, 1991). Operant constructs concern peoples' spontaneous behavioural choices in the absence of situational constraints, and respondent constructs concern peoples' reactions to specific environmental presses or situations (McClelland, 1987). Idiographic (i.e. self-generated) goals have operant properties because the goal-stems themselves are spontaneous and unconstrained, but at the same time, nomothetic ratings of those goal-stems have respondent properties because they concern participants' responses to a specific contextual cue (i.e. the question; Emmons, 1999). Because of this, it seemed possible that the personal goal variables would evidence a pattern midway between the implicit and explicit measures, or show a mixed profile.

In sum, we assessed the distinction between power and intimacy in six different ways. Two measures were implicit, although they represent very different approaches to assessing implicit attitudes and/or motivation: the IAT and the TAT. We hoped to compare these 'old-school' and 'new-school' approaches to implicit personality assessment. Two measures represented explicit motives and values, as assessed by the PRF and the AI. We hoped to compare value and motive constructs with each other and with the implicit measures. The final two measures represented idiographic personal goals, as approached via simple importance ratings and by PLOC (self-concordance) ratings. We expected that the goal constructs would be empirically distinguishable from the implicit and the explicit measures, because goals are conceptually distinguishable from both.

Research questions and specific hypotheses

First, we planned to examine the factor structure among these measures. Do separate factors emerge corresponding to explicit measures versus implicit measures, or

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corresponding to motives versus values versus attitudes versus goals? Such information would be unique in the personality literature. We hypothesised that the implicit and explicit measures would load on separate factors, supporting this important distinction within the literature, and that the goal variables would also load on a separate factor. We did not venture specific predictions concerning the factor structure of motives (PRF) and values (AI).

Second, we also planned to compare the measures with each other as predictors of several different types of outcome. These outcomes ranged from highly subjective outcomes (i.e. life-satisfaction and psychological well-being) to somewhat more behavioural outcomes (i.e. choice between an intimacy-related vs. a power-related academic behavioural opportunity; choice to cooperate vs. compete in a social dilemma). Based on McClelland et al.'s (1989) reasoning, and also on previous findings in the literature, we hypothesised that the implicit measures (i.e. TAT and IAT) would predict the more behavioural outcomes, and that the explicit measures (i.e. values and motives) would predict the more subjective outcomes, with results for the mixed constructs (i.e. goals, based on self-generated stems) falling in between. Of course, none of the self-report outcomes above are truly behavioural, a fact which will be kept in mind as we interpret the results. Still, the opportunity and dilemma 'choice' items presumably tap the same processes that would occur within actual behavioural choice situations.

Third, based on past findings (Emmons, 1991; Kasser & Ryan, 1993, 1996), we specifically expected that the relative extrinsic value orientation variable would correlate negatively with well-being. We made no other specific predictions concerning well-being, although we suspected that at least some of the other five power/intimacy difference scores would also predict well-being.

METHODS

Participants and procedure

Participants were social psychology students at the University of Missouri, who took part in exchange for extra course credit. Early in the semester 446 participants generated and rated a set of intimacy and power personal goals during an in-class questionnaire session, and also completed the PRF and the AI and measures of psychological well-being. Approximately 3 weeks later, during another in-class session, 204 participants wrote stories to TAT pictures, which were later coded by trained judges. At this class session they also rated their preferences for various types of experiences in which power was contrasted with intimacy. Over the course of the semester, 209 participants attended a lab session and completed a power-intimacy IAT, in which their own intimacy or power goals were paired with pleasant or unpleasant words. At the end of the semester participants were asked to participate in a social dilemma, specifically, a limited resource dilemma. Their initial responses to the dilemma were recorded (i.e. how much they would take from the commons), and they also rated why they would make that decision (i.e. for ethical/moral reasons, exploitative reasons or to avoid being exploited). In the results section, we present data only for the 192 participants who had complete data on all six of the predictors. Scattered missing data among the dependent measures reduced the *N* for some analyses, but never to below 179. More detail is provided on the measures, below.

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Predictor variables

Goal measures

During the initial in-class assessment, participants were asked to write down eight personal strivings, defined as 'things that you typically strive to do. These need not be objectives that you consciously list or keep in mind, but rather, actions that you find yourself trying to do (whether or not you succeed), at least on occasion' (Emmons, 1989). The striving methodology was chosen so that participants would consider their natural intentional orientations, boosting the chance the resulting constructs would fall midway between operant and respondent (Emmons & McAdams, 1991), as discussed above. Four goals were constrained to be intimacy goals, 'involving emotional connections and friendships/relationships', and four were constrained to be power goals, 'involving social power, influence and control'. Examples were given of each type of goal.

Next, we asked participants to rate why they would pursue each of their eight goals, in terms of four different reasons or 'perceived loci of causality' (PLOC): external ('You strive for this goal because somebody else wants you to, or because the situation seems to compel it'); introjected ('You strive for this goal because you would feel ashamed, guilty or anxious if you did not'); identified ('You strive for this goal because you really believe that it is an important goal to have'); and intrinsic ('You strive for this goal because of the enjoyment or stimulation which that goal provides you'). These reasons have been employed in much past self-concordance research (Sheldon & Elliot, 1998, 1999) and have been shown to range from low to high on a continuum of motivational internalisation. As in past research, aggregate self-concordance scores were computed by summing the identified and intrinsic ratings and subtracting the external and introjected ratings; this was done separately for the intimacy goals and for the power goals. In addition, participants rated 'how important each of your eight goals is to you', using a 1 (not at all) to 5 (very much) scale. Two aggregate importance scores were computed, one for the intimacy goals and one for the power goals. Finally, we computed relative power versus intimacy striving variables by subtracting the intimacy score from the power score, for both the importance ratings (IMP) and the self-concordance ratings (PLOC). Notably, difference scores can be quite unreliable (Wittman, 1988). We attempted to compute reliabilities for these difference scores by reverse coding all of the power ratings and then doing an item-level analysis. These reliabilities were in fact very low (0.09 and 0.13 for IMP and PLOC, respectively), suggesting that explicit ratings of power and intimacy goals do not necessarily go in countervailing directions. Although this is a study limitation, we nevertheless deemed it worthwhile to include the goal variables for exploratory purposes.

We were also able to assess participants' progress in attaining the eight goals, 3 months later. Specifically, participants were asked: 'Please tell us how well you have attained each of your eight goals, this semester. To what extent were you able to successfully achieve each goal'? A 1 (not at all well) to 5 (very well) scale was provided. Power progress and intimacy progress variables were computed by averaging the four ratings and we computed a relative power versus intimacy progress variable by subtracting the four intimacy ratings from the four power ratings (again, the alpha of 0.06 was very low).

Value and motive measures

During the first in-class assessment participants also completed the Aspirations Index (AI; Kasser & Ryan, 1996), a 30 item measure of intrinsic and extrinsic values. Participants read 'The questions below ask you about aspirations you may have for the future. For each item, fill in a number which indicates how important it is to you that the goal be attained in the future'. Example extrinsic values are 'I will be financially successful' and 'I will be admired by many people'; example intrinsic values are 'I will feel that there are people who really love me, and whom I love' and 'I will assist people who need it, asking nothing in return'. As in past research (i.e. Sheldon & McGregor, 2000, Sheldon, Sheldon, & Osbaldiston, 2000), a relative extrinsic value orientation variable was computed by subtracting the mean of the 15 intrinsic value items from the mean of the 15 extrinsic value items (alpha for the 30 items, after reverse coding the extrinsic items, was 0.87).

Participants also completed the dominance and nurturance subscales of the Personality Research Form (PRF; Jackson, 1984) by responding to 32 true–false items, 16 for each subscale. An example dominance item is 'I feel confident when directing the activities of others' and an example nurturance item is 'I would rather have a job serving people rather than making something'. Dominance and nurturance scores were computed by counting the appropriate responses, and a relative dominance versus nurturance measure was computed by subtracting the nurturance score from the dominance score (alpha for the 32 items, after recoding the power items, was 0.70).

TAT measure

Two raters were trained on expertly scored practice materials from the volume by Smith (1992), as well as a variety of previously scored TAT stories (from King, 1995), until they had achieved 99% of expert scoring on intimacy and 96% of expert scoring on power motive. Both raters then independently coded all of the stories. Intimacy motive scoring is conducted in two stages. First a story must be judged as containing either a relationship producing positive affect or reciprocal dialogue (McAdams, 1989). If a story passes one or both of these tests it is then scored for other instantiations of intimacy. A total of 10 categories are considered for coding. In addition to positive affect and dialogue, examples of other coding categories include psychological growth through relationships, commitment and concern, connection with the outside world and union. Inter-rater reliability for the Intimacy motive scoring was excellent ($r = 0.94$), and the raters' scores were averaged to create a score for each participant. Scores ranged from 0 to 4.67. The mean intimacy score was 1.53 ($SD = 1.12$). Power motive was scored using the running text method (Winter, 1992). Power is scored when individuals in the stories are concerned with having influence, persuading or convincing others, experience positive affect associated with exerting social influence, negative emotion associated with lack of power and concern for status symbols and prestige. Scoring is performed on images in the story following conventions described by Winter, (1992). Reliability was, again, excellent ($r = 0.91$). Power motive scores were created by averaging across the independent raters. Power motive scores ranged from 0 to 3 with a mean of 0.67 ($SD = 0.66$). In a method similar to that described above, we computed a TAT power – intimacy difference score. Because the power mean and variability were considerably lower than the intimacy mean and variability, we standardised both scores before computing this difference so that intimacy would not be over-weighted in the composite. There was no way to conduct an item-level difference score reliabilities analysis.

IAT measure

When participants arrived at the lab, their eight goals had already been typed into the computer by a research assistant. Recall that four goals were intimacy goals (examples include 'make my girlfriend happy' and 'stay close with family') and four goals were

DOI: 10.1002/per

power goals (examples include 'be respected by others' and 'get a higher position at work'). The goals could be no longer than 32 characters, including spaces. The experimenters shortened goals that were too long by replacing the word 'and' with '&' and replacing the word 'with' with 'w/'. In a few cases, the goals had to be modified slightly by omitting unnecessary words.

As per normal IAT procedure, participants worked through seven blocks of trials. In each block, participants responded to randomly selected stimuli by pressing a key on either the left or right side of the keyboard (the Q or P keys, respectively). The computer program recorded the time between the presentation of the stimuli and the participants' responses; this time difference is called the latency. Block 1 (24 trials) consisted of random presentation of pleasant (joy, peace, smile, sunrise) and unpleasant (agony, death, slime, vomit) words; participants had to determine which category the word belonged to and press the appropriate key. Block 2 (eight trials, one for each goal) consisted of presentation of the participant's own goals; participants had to determine if each goal was a power or intimacy goal and press the appropriate key. Block 3 (24 trials) and block 4 (40 trials) consisted of alternated presentations of a word (odd-numbered trials) or a goal (even-numbered trials). Participants had to determine if each stimulus belonged to the left or the right category where the left category may have contained, for example both pleasant words and intimacy goals and the right category may have contained both unpleasant words and power goals. Block 5 (eight trials) was identical to block 2, except that the left and right responses were reversed. Block 6 (36 trials) and block 7 (40 trials) were similar to blocks 3 and 4. However, the pairing of the goal type (intimacy or power) with the word type (pleasant or unpleasant) was reversed. (In the initial formulation of IAT, blocks 3 and 6 were called 'practice' blocks and blocks 4 and 7 were called 'test' blocks; however, under the improved scoring algorithm discussed below, blocks 3, 4, 6 and 7 are all included in the analyses, see Greenwald, Nosek, & Banaji, 2003.

Counterbalancing was used to minimise order of presentation effects. Participants were assigned a consecutive number when they scheduled their IAT sessions. Odd-numbered participants saw a pairing of power goals and pleasant words on the left and a pairing of intimacy goals and unpleasant words on the right in blocks 3 and 4. Further, odd-numbered participants saw a pairing of intimacy goals and pleasant words on the left and a pairing of power goals and unpleasant words on the right in blocks 6 and 7. In contrast, even-numbered participants saw a pairing of intimacy goals and pleasant words on the left and a pairing of power goals and unpleasant words on the right in blocks 3 and 4, and they saw a pairing of power goals and pleasant words on the left and a pairing of intimacy goals and unpleasant words on the right in blocks 6 and 7.

As per normal IAT procedure, in blocks 3, 4, 6 and 7, the stimuli were alternated. On odd-numbered trials, participants saw a randomly selected word that was either pleasant or unpleasant. On even-numbered trials, they saw one of their own self-generated goals that was randomly selected from the set of four intimacy goals and four power goals. On each trial participants tried to correctly place the stimulus into one of the two categories that appeared on the upper right or left of the screen, and they responded by pressing the Q or P key.

Exactly following the recommended scoring algorithm of Greenwald et al. (2003), p. 214), we analysed the data from blocks 3, 4, 6 and 7, and we eliminated trials that had latencies greater than 10 000 milliseconds. The mean latencies for correct trials were computed for each block and these means were then used in computing the pooled standard deviations for blocks 3 and 6 (the practice blocks) and for blocks 4 and 7 (the test blocks).

DOI: 10.1002/per

The latencies for trials with errors in each block were replaced with block mean correct response latencies +600 milliseconds, and then a new mean latency was computed for each block. A *D*-score was computed by subtracting the corrected mean latencies of block 3 from block 6 and dividing by the pooled standard deviation of those blocks. Similarly, a *D*-score was computed by subtracting the corrected mean latencies of block 4 from block 7 and dividing by the pooled standard deviation of those blocks (in other words, the mean reaction time of the blocks pairing pleasant and intimacy was subtracted from the mean reaction time of the blocks pairing pleasant and power). The average of these two modified *D*-scores was the overall IAT score for each participant. Higher IAT scores indicated a greater implicit association of power goals with pleasant words versus intimacy goals, that is higher power than intimacy motivation. Notably, we also computed IAT scores separately for the practice and test blocks, allowing consideration of split half reliability. This coefficient was somewhat low (0.39).

Outcome measures

Well-being

In the first in-class session, participants rated their current well-being, via the 20 item Positive affect/negative affect scale (PANAS; Watson, Tellegen, & Clark, 1988) and the 5 item Satisfaction with Life scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). As in past research (Sheldon & Kasser, 1998, 2001), we computed a single subjective well-being score (SWB) by standardising then adding positive affect (alpha = 0.84) and life-satisfaction (alpha = 0.84) and subtracting the standardised negative affect variable (alpha = 88).

Behavioural preferences

During the in-class session in which the TAT was administered, participants were also asked questions concerning their preferred activities or opportunities. One group of questions concerned ‘opportunities for undergraduates’, and read ‘If the psychology department was going to offer opportunities for undergraduates to learn new psychological techniques, which of the following would most appeal to you’? Seven items were presented with 1 (not at all) to 7 (extremely) scales, each item representing either power opportunities (i.e. ‘learn to perform hypnosis’, ‘learn effective techniques of persuasion’) or intimacy opportunities (i.e. ‘learn some counseling techniques to help others’, ‘learn the “art of listening” better to help others’). A power versus intimacy opportunity preference variable was computed by subtracting the mean of the ratings on the intimacy items from the mean of the ratings on the power items. Reliability for this measure was low (0.29); exploratory item analysis to construct the best scale reached an alpha of 0.69, but since results did not differ for the abbreviated measure versus the complete measure, we employed the complete measure.

Participants were also asked to select between two potential laboratory jobs on campus, with equal pay and hours. The power-oriented job read ‘The professor who runs the lab is world famous for her work on the problem. There are about 20 students working in the lab and they often have to compete to get the very best assignments. The students who work in the lab know that though the work is hard, it will look great to have this experience on their resumes’. The intimacy-oriented job read ‘The professor who runs the lab is well respected but hardly world famous. She is extremely warm and makes time for each of the 20 students who work in her lab. One of the nice things about working in this lab is that many of the students stay the same each year and everyone seems to really get along well. The work is hard, but the students seem to enjoy hanging out together very much'. Participants chose either the power or the intimacy job, a dichotomous outcome variable.

Finally, participants were asked about their preferences within each of six pairs of items referring to academic situations (i.e. grading systems, group work, mode of test feedback), with one member of the pair mapping onto intimacy and the other onto power. For example participants selected between being in a group in which 'everyone gets a chance to talk' versus 'you get to lead the discussion', and selected between a classroom situation in which, after the participant does well on a test, 'the professor encourages the whole class to do well' versus 'the professor mentions your name when talking about the test'. A power versus intimacy academic preference variable was computed by counting how many power options were selected across the six pairs (alpha = 0.59).

Social dilemma measures

At the final session at the end of the semester, participants were presented with the same limited resource dilemma employed by Kasser and Sheldon (2000). They were asked to imagine that they were one of four timber companies, all harvesting within the same national forest. It was explained that higher bids within a particular year would lead to greater profit for oneself, but would also lead to the eventual depletion of the forest, if everyone makes high bids (see Kasser and Sheldon, 2000, for more details). Participants then read 'What we are interested in is how you would think and behave in a situation such as this. Please answer the questions below, by imagining yourself in the above situation and anticipating your own responses'. The first question was 'imagine that it is time to make your first bid. How many acres would you cut in the first year'? Participants responded to this single item using a scale ranging from 1 (0–20 acres) to 5 (81–100 acres). Thus, higher scores on this measure indicate a greater willingness to exploit a communal resource. Afterwards participants were asked why they made the bid they made, in terms of six reasons, using a 1 (not at all) to 5 (very much) scale. Two involved moral considerations (i.e. 'because these bids are the most fair or ethical ones to make'), two involved the desire to out-compete others (i.e. 'because these bids will allow me to make more profit than the other companies') and two involved the desire to avoid being exploited by others (i.e. 'because these bids will keep me from being taken advantage of by the other companies'). Moral, exploitative and defensive reason variables were computed by averaging the two items for each construct (alphas = 0.76, 0.89 and 0.85, respectively).

RESULTS

Table 1 presents the means and standard deviations of the major study variables. As can be seen, many of the difference scores are negative, indicating that participants generally prefer intimacy and intrinsic themes over power and extrinsic themes (Kasser, 2002). Table 2 presents the correlations among the six predictor variables. Below, we present factor analyses designed to reduce these correlations.

Factor analyses of the six predictors

In order to derive independent linear combinations of the six predictors, we conducted a principal components analysis. The initial solution yielded eigenvalues of 1.86, 1.23, 0.97, 0.90, 0.53 and 0.51, suggesting that a one, two or a four component solution might be

Table 1. Descriptive statistics for major study variables

	Mean	*SD*
Predictor variables		
IAT (power vs. intimacy latencies)	−0.24	0.37
TAT (power vs. intimacy motives)	−0.04	1.31
PRF (power vs. intimacy motives)	−0.19	5.11
AI (extrinsic vs. intrinsic values)	−4.34	2.46
Self-concordance (for power vs. intimacy goals)	−0.45	2.07
Importance (of power vs. intimacy goals)	0.15	0.75
Outcome variables		
SWB	5.19	1.61
Preference for power versus intimacy opportunities	−0.28	1.57
Preference for power versus intimacy lab experience	16%	—
Preference for power versus intimacy class context	2.15	2.46
Size of forest bid	54 acres	12 acres
Moral reasons for the bid	3.30	1.00
Exploitative reasons for the bid	2.82	1.20
Defensive reasons for the bid	3.03	1.14
Power versus intimacy goal progress	0.003	0.65

Note: All scores except SWB, forest bid and the three reasons represent relative differences between power and intimacy. For this table, forest bid scores were converted from a 1–5 scale to a 1–100 scale.

Table 2. Correlations among the six predictor variables

	IAT	TAT	PRF	AI	Slf-Con	Import
1. IAT	—					
2. TAT	0.17*	—				
3. PRF	0.03	0.26**	—			
4. AI	0.20**	0.09	0.37**	—		
5. Self-concordance	0.18**	0.14*	0.28**	0.16*	—	
6. Importance	−0.01	−0.10	0.15*	0.07	0.40**	—

Note:
$^{*}p \leq 0.05$.
$^{**}p \leq 0.01$.

interpretable. We examined the two and four component solutions, using varimax rotation to produce interpretable factors.[1]

For the two component solution, the first rotated factor was defined by the IAT (0.53), the TAT (0.69), the PRF (0.60) and the AI (0.61), and the second factor was defined the two goal variables (PLOC = 0.75, IMP = 0.86). No cross-loading exceeded 0.27, except that the PRF loaded 0.38 on the goal factor. This twofold pattern suggests that the two implicit measures (i.e. the IAT and TAT) converge with one another and also with the explicit motive and value measures (i.e. the AI and PRF), whereas the goal measures load on their own factor. For the four component solution, the first factor was defined by the two goal variables (PLOC = 0.80, IMP = 0.86), the second factor was defined by the PRF and AI (0.71 and 0.89), the third factor was defined by the TAT (0.94) and the fourth factor was defined by the IAT (0.95). No cross-loading exceeded 0.25, except that the PRF loaded 0.39 on the TAT factor. This fourfold pattern suggests that goals, motives/values, the TAT and the IAT supply distinctive information. They are also consistent with King's (1995) finding of primarily method variance factors among a large set of implicit and explicit motive measures.

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[1] Oblimin and equamax rotations yielded very similar results and will not be discussed further. For the reader's information, principal axis, maximum likelihood and generalised least squares extraction methods yielded less interpretable solutions and also will not be discussed further.

Summarising the results of these factor analyses in terms of our hypotheses, there is some evidence that the two implicit measures converge with one another, and good evidence that the goal variables, which have both operant and respondent characteristics, are distinct from the clearly implicit and the clearly explicit measures, just as suggested by several contemporary theories (Carver & Scheier, 1998; Elliot & Church, 1997; Emmons & McAdams, 1991). In addition, there is also evidence that motives and values, which share a focus on conscious orientations and guiding principles despite coming from different traditions within personality psychology, have considerable overlap with one another; that the PRF explicit motives measure shares some variance with both the goal measures and the TAT measure; and that the clearly explicit (AI, PRF) and clearly implicit measures (TAT, IAT) may have more in common with each other than one would expect.

Associations of the six predictors with outcomes

Table 3 presents the zero-order correlations between the six predictors and the nine outcomes. Again, the predictors are all scored such that higher scores indicate a greater preference for power over intimacy. As can be seen, the IAT was positively correlated with the amount taken in the resource dilemma and with endorsement of exploitative/ competitive reasons for the amount taken. The TAT was positively correlated only with preferences for power-related undergraduate opportunities. The PRF was positively correlated with the three power behaviour preference variables, was correlated with reduced endorsement of moral reasons and greater endorsement of exploitative reasons for the amount taken in the resource dilemma and was correlated with greater power than intimacy goal progress. The AI was also positively correlated with the power behaviour preference variables and the resource dilemma reason variables, and in addition, was

Table 3. Correlations between the six predictor variables and the nine outcome variables

	SWB	*P* versus *I* OpPref	*P* versus *I* LabPref	*P* versus *I* AcPref	Forest bid	Moral Rsns	Exploit Rsns	Defense Rsns	*P* versus *I* progress
Predictors									
IAT	−0.01	0.06	0.04	0.12	0.16*	−0.13	0.15*	0.06	0.04
TAT	−0.11	0.18*	0.09	0.03	0.02	−0.04	0.01	−0.09	0.11
PRF	−0.01	0.37**	0.32**	0.39**	0.06	−0.22**	0.18*	0.10	0.22**
AI	−0.20**	0.43**	0.32**	0.44**	0.26**	−0.35**	0.28**	0.23**	0.11
Slf-con	0.01	0.03	0.12	0.09	−0.06	−0.11	0.09	−0.02	0.20**
Import	0.04	−0.03	0.08	0.07	−0.03	−0.03	0.06	0.01	0.15*

Note: '*P* versus *I*' refers to 'power minus intimacy'.

$^{*}p < 0.05$.

$^{**}p < 0.01$.

Table 4. Simultaneous regression coefficients between the six predictor variables, entered as a set, and the nine outcome variables

	SWB	*P* versus *I* OpPref	*P* versus *I* LabPref	*P* versus *I* AcPref	Forest bid	Moral Rsns	Exploit Rsns	Defense Rsns	*P* versus *I* progress
Predictors									
IAT	0.05	−0.02	−0.02	0.07	0.13+	−0.07	0.11	0.05	0.00
TAT	−0.12	0.10	0.02	−0.08	−0.01	0.05	−0.07	−0.13	0.05
PRF	0.09	0.25**	0.22**	0.30**	0.01	−0.12	0.11	0.08	0.15+
AI	−0.24**	0.35**	0.24**	0.33**	0.26**	−0.29**	0.22*	0.21*	0.03
Slf-con	0.02	−0.09	0.00	−0.06	−0.14	−0.02	0.00	−0.08	1.10
Import	0.02	− 0.05	0.04	0.02	0.02	0.01	0.03	0.02	0.08

Note: +, $p < 0.10$, coefficients are unique variances.
'*P* versus *I*' refers to 'power minus intimacy'.
$^{*}p < 0.05$.
$^{**}p < 0.01$.

correlated with reduced SWB, a greater amount taken in the resource dilemma and greater endorsement of defensive reasons for the resource dilemma choice. The PLOC and IMP variables correlated only with greater power than intimacy goal progress.

To condense this data and determine the unique contributions of each predictor we conducted nine hierarchical regression analyses, one for each of the nine outcome variables. At the first step the six (centered) predictors were entered as a block, and at the second step 15 product interaction terms were entered, representing all possible two-way interactions between the six predictors.[2]

Table 4 contains the standardised coefficients that resulted at the first step of each of the nine analyses. As can be seen, the IAT uniquely predicted only the amount harvested in the resource dilemma (marginally) and the TAT was unrelated to the outcomes. In addition, neither PLOC nor IMP (the goal variables) emerged as significant in either analysis. Instead, the PRF (the motive variable) and the AI (the value variable) emerged as the best predictors. Replicating past findings (Kasser, 2002), the AI (scored as preference for extrinsic over intrinsic values) predicted reduced SWB. The AI also predicted the three behavioural preference variables and the four social dilemma variables. The PRF predicted the three behavioural preference variables and also predicted better power than intimacy goal progress (marginally).

DISCUSSION

Ours is the first study to examine the association of the TAT, the most important old school measure of implicit motives, with the IAT, the most important new school measure. Such a comparison seems long overdue, assuming that new constructs and measures should be integrated with existing constructs and bodies of knowledge. In addition to comparing these two implicit measures we also examined two clearly explicit measures of power versus intimacy orientation, based on value (AI) and motive (PRF) constructs. Both of these assess broad and intentionally based personality dispositions, but from somewhat different conceptual angles. Finally, we examined two goal-based measures of power versus intimacy orientation, importance and self-concordance. Because idiographic goal constructs are ‘midway’ between implicit/operant and explicit/respondent, we reasoned that they might help illuminate both types of construct (Emmons & McAdams, 1991). The results provided some confirmation for our hypotheses, but also contained some surprises. We will summarise the results, while considering some broader implications.

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[2] This second step was merely exploratory, to examine the possibility that certain combinations of predictors are empirically important (i.e. a person whose PRF scores and TAT scores are both high or low may demonstrate high convergence between implicit and explicit motives, a potential sign of integration or inner unity). We made no predictions concerning these interactions, and indeed, out of 135 possible interactions only 8 were significant and no particular interaction (i.e. between PRF and TAT) was significant more than twice. Because of the likely chance nature of these findings, we omit further discussion of interaction results.

The TAT and IAT were weakly but significantly correlated with one another, suggesting that these two approaches to implicit personality have at least some overlap. Also, the two goal measures were correlated with one another and the value and motive measures were inter-correlated. Thus, there was consistent convergence *within* type of measure. However, there were also correlations *across* measures of different types. Principal components analyses suggested that either a two or a four factor solution might be preferred. In the two factor solution, the TAT, IAT, PRF and AI loaded on one factor and the two goal measures loaded on the other factor. This solution suggests, somewhat surprisingly, that the clearly implicit (TAT, IAT) and clearly explicit measures (AI, PRF) can be grouped together, in opposition to the goal measures (importance, self-concordance). However, in the four factor solution the TAT and IAT split apart, each loading on its own factor. We believe the latter result may better represent the true state of affairs, indicating that values/motives, goals, TAT and IAT are empirically as well as methodologically and conceptually distinct constructs (King, 1995).

We also examined the association of the six predictors with a range of ‘outcome’ variables. The AI correlated with subjective well-being (SWB), consistent with past research (Kasser, 2002) showing that favouring extrinsic over intrinsic values predicts lower SWB. However, none of the other measures were associated with SWB. Consistent with hypotheses, the IAT correlated with the presumably most behavioural measure, namely, competitive choice in a social dilemma. However, it was not predictive of any of the other outcomes. The TAT correlated with a preference for power versus intimacy-oriented undergraduate opportunities, consistent with the idea that the TAT predicts operant behavioural choices (McClelland et al., 1989). However, the TAT also was not predictive of any of the other outcomes. The two goal variables, concerning feeling more self-concordant regarding power goals relative to intimacy goals, or attaching more importance to power than intimacy goals, correlated with power relative to intimacy goal progress. This is consistent with past goal research showing that self-concordance predicts goal attainment (Sheldon, 2004; Sheldon & Elliot, 1999). Finally, the AI and PRF, the most ‘explicit’ measures, correlated with most of the outcomes. Simultaneous regression analyses controlling for overlaps between the predictors essentially confirmed these patterns. They also suggested that despite their loading upon a common factor, the AI and the PRF contributed unique variance to several of the outcomes. Finally, these analyses suggested that the AI was the most effective predictor, overall, in these data.

Why was the AI the strongest predictor? One might explain this by saying that broad conscious values are the most important or central feature of personality. However, one might also note that claimed values are perhaps the most explicit or ‘self-attributed’ of the predictors, and that, although we intended to assess a variety of outcomes ranging from operant to respondent, all of the dependent measures were based ultimately on self-report, suggesting that they may tap primarily respondent and self-presentational processes. Thus, the finding may primarily reflect method variance. Future research will be necessary to distinguish between these explanations. Future research will also be needed concerning unambiguously behavioural outcomes, which will presumably better illustrate the utility of the IAT and TAT.

In addition to assessing only self-report outcomes, this study has some other limitations. One is that the study focused on a complex difference score, namely, power versus intimacy. This was somewhat unconventional treatment for most of the study constructs, which did not always meet conventional reliability standards. Again, this procedure was chosen because most IAT research has focused on just such a difference score. However, the IAT itself has been criticised for this practice, as it is not clear, when there is an IAT effect, whether it is feelings regarding one pole or the other pole that are the source of the effect (Blanton & Jaccard, 2006; Blanton et al., 2006). Hopefully, future refinements in the IAT will lead to a more unidimensional construct (i.e. see Brunstein & Schmitt, 2004), at which point its convergence with more conventional measures can be more clearly established. Yet another limitation is that we assessed the IAT using participant power and intimacy goal statements, stems which were longer and more idiographic than standard IAT assessment. IAT results may have been different if power and intimacy had been assessed using power versus intimacy images or single words, rather than participants' own goal statements. Still, it is also worth noting that using participants' own goal statements in the IAT may enhance the meaning of the stimuli, as these idiographic units are actually part of participants' self-concepts. Finally, we did not ask participants to explicitly rate their power and intimacy goals using the same evaluative words employed by the IAT, instead having them rate goal importance; if we had used the same evaluative words, results may have been different.

Still, we believe that this study provides unique new data concerning a broad range of important personality constructs, and hope that it will encourage researchers to give greater attention to the integration of old-school and newer-school approaches to assessing implicit personality.

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